IN THE CLAIMS

The following listing of the claims is provided in accordance with 37 C.F.R. § 1.121.

1. (original) A temperature measuring system, comprising:

a heat source;

a component coupled to the heat source; and

at least one thermistor coupled to the component and adapted to monitor temperature of the component, wherein the thermistor comprises a core-shell micro structure having a shell disposed about a core, the core comprising Cr_2O_3 and the shell comprising a rare earth element compound.

2. (original) The system according to claim 1, wherein the heat source is an engine.

3. (original) The system according to claim 1, wherein the component is a catalytic converter.

4. (original) The system according to claim 1, comprising a measuring device coupled to the thermistor.

5. (original) The system according to claim 1, comprising a motorized vehicle.

6. (currently amended) The system according to claim 1, wherein the rare earth element compound is selected from a group consisting of Pr, Nd, Sm, Eu, Gd, [[Td]] Tb, Dy, Er, Yb, Ce, and Y.

7. (original) The system according to claim 1, wherein the shell is substantially stable at a temperature up to about 1000 degrees Celsius.

8. (original) The system according to claim 1, wherein the shell is adapted to reduce chromia loss due to volatilization.

9. (currently amended) The system according to claim 1, wherein the shell is formed by at least one compound selected from a group consisting of [[M_2O3]] $\underline{M_2O_3}$, $MCrO_3$, M-nitrate, M-carbonate, M-hydroxide, alkooxides, carboxylates,and a mixture of M_2O_3 and Cr_2O_3, wherein M comprises the rare earth element compound.

10. (currently amended) The system according to claim [[1]] 9, wherein the at least one compound comprises an aliovalent dopant selected from a group consisting of Ca, Ba, Sr, Mg, Si and Ti.

11. (original) A thermistor, comprising:

a plurality of electrical contacts; and

a thermistor body coupled to the plurality of electrical contacts, wherein the thermistor body comprises a core-shell microstructure having a shell disposed about a core, the shell comprising a rare earth element compound, the core comprising Cr_2O_3.

12. (original) The thermistor according to claim 11, wherein the shell is adapted to stabilize the core up to temperature of about 1000 degrees Celsius.

13. (original) The thermistor according to claim 11, wherein the shell is adapted to reduce chromia loss due to volatilization in the core.

14. (original) The thermistor according to claim 11, wherein the shell comprises MCrO3, and M comprises the rare earth element compound.

15. (currently amended) The thermistor according to claim 14, where M is selected from a group consisting of Pr, Nd, Sm, Eu, Gd, [[Td]] Tb, Dy, Er, Yb, Ce, and Y.

16. (original) The thermistor according to claim 11, wherein the shell comprises M_2O_3, and M comprises the rare earth element compound.

17. (original) The thermistor according to claim 11, wherein the shell comprises $MCrO_3$, and M comprises the rare earth element compound, which comprises Y.

18. (original) The thermistor according to claim 11, wherein the shell is formed by at least one compound selected from a group consisting of M_2O_3, $MCrO_3$, M-nitrate, M -carbonate, M- hydroxide, alkooxides, carboxylates, and a mixture of M_2O_3 and Cr_2O_3, wherein M comprises the rare earth element compound.

19. (original) The thermistor according to claim 11, wherein the shell is formed by at least one aliovalent doped compound selected from a group consisting of M_2O_3, $MCrO_3$, M-nitrate, M-carbonate, M-hydroxide, alkooxides, carboxylates, and a mixture of M_2O_3 and Cr_2O_3, wherein M comprises the rare earth element compound.

20. (original) The thermistor according to claim 11, wherein the shell comprises at least one aliovalent dopant selected from a group consisting of Ca, Ba, Sr, Mg, Si and Ti.

21. (original) The thermistor according to claim 11, wherein the temperature measuring stability of the thermistor ranges up to about 1000 degrees Celsius.

22. (original) The thermistor according to claim 11, wherein the thermistor has a temperature measuring variability of less than plus or minus 5 degrees Celsius after about 1000 hours at about 1000 degrees Celsius.

23. (original) A temperature measuring system, comprising:

means for materially stabilizing a thermistor comprising Cr_2O_3 and at least one stabilizing material; and

means for electrically contacting the thermistor.

24. (withdrawn) A method for measuring temperature, comprising:

providing a thermistor, comprising a microstructure having a shell disposed about a core, the core comprising Cr_2O_3 and the shell comprising a rare earth element compound.

25. (withdrawn) The method according to claim 24, comprising:

providing an engine; and

providing a catalytic converter for pneumatic communication with exhaust from the engine.

26. (withdrawn) The method according to claim 24, comprising providing a sensing device couplable to the thermistor.

27. (withdrawn) The method according to claim 24, comprising providing a motorized vehicle.

28. (withdrawn) The method according to claim 24, comprising providing a combustion engine.

29. (withdrawn) The method according to claim 24, comprising:
providing a powder for the core and shell; and
pressing and sintering the powder to form the thermistor.

30. (withdrawn) The method according to claim 24, wherein providing the thermistor comprises forming the shell having at least one compound selected from a group consisting of M_2O_3, MCrO3, M-nitrate, M- carbonate, M- hydroxide, alkooxides, carboxylates, and a mixture of M_2O_3 and Cr_2O_3, wherein M comprises the rare earth element compound.

31. (withdrawn) The method according to claim 24, wherein providing the thermistor comprises forming the shell having a material comprising Y.

32. (withdrawn) The method according to claim 24, wherein providing the thermistor comprises forming the shell having the rare earth element compound selected from a group consisting of Pr, Nd, Sm, Eu, Gd, Td, Dy, Er, Yb, Ce, and Y.

33. (withdrawn) The method according to claim 24, wherein providing the thermistor comprises forming the shell having at least one aliovalent doped compound selected from the group consisting of M_2O_3, MCrO3, M-nitrate, M -carbonate, M – hydroxide, alkooxides, carboxylates, and a mixture of M_2O_3 and Cr_2O_3 and wherein M comprises the rare earth element compound.

34. (withdrawn) The method according to claim 24, wherein the shell is adapted to stabilize the core over a temperature range up to about 1000 degrees Celsius.

35. (withdrawn) The method according to claim 24, wherein the shell is adapted to reduce chromia loss due to volatilization.

36. (withdrawn) The method according to claim 24, wherein the thermistor is stable up to about 1000 hours at about 1000 degrees Celsius.

37. (withdrawn) The method according to claim 24, wherein providing the thermistor comprises:

providing a solution having a shell material for the shell;

combining Cr_2O_3 with the solution to form a mixture;

mixing a base with the mixture;

precipitating a substance from the mixture;

calcining the substance; and

sintering the substance.

38. (withdrawn) The method according to claim 37, comprising compacting the substance about leads to form the thermistors.

39. (withdrawn) The method according to claim 24, wherein providing comprises:

dispersing Cr_2O_3 powder in a basic solution to form a mixture

adding a dispersant to the mixture;

adding M-nitrate solution;

settling a precipitate in the mixture;

calcining the precipitate; and

sintering the precipitate.

40. (withdrawn) The method according to claim 39, comprising compacting the substance about leads to form the thermistor.